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HEALTH AND SAFETY PLAN SUPPLY SIDE LANDFILL LANDFILL COVER STUDY NS
GREAT LAKES IL
11/1/2003
VERSAR, INC.

Department of the Navy

Naval Training Center

FINAL

**Health and Safety Plan
Supply Side Landfill
Landfill Cover Study**

**Naval Training Center (NTC) - Environmental Department
Building 1-A, 201 Decatur Avenue
Great Lakes, Illinois 60088-5600**

Prepared by

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November 2002

Supply Side Landfill
HEALTH AND SAFETY PLAN
APPROVAL SIGN-OFF

I have read, I understand, and I approve the following information and procedures set forth in this Health and Safety Plan (and attachments).

Gary Goodheart

Project Manager

 11/20/02
Signature Date


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Field Investigation Task Leader

 11/21/02
Signature Date

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Corporate Health & Safety Officer

 11-20-02
Signature Date

ACRONYMS & ABBREVIATIONS

Abs	absorption
ASTM	American Society for Testing and Materials
BBP	bloodborne pathogens
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CGI	combustible gas indicator
Con	skin or eye contact
CPR	cardiopulmonary resuscitation
DB	dry bulb
eV	electron volt
FID	flame ionization detector
GT	globe temperature
HASP	Health and Safety Plan
HEPA	high efficiency particulate air
IDLH	Immediately Dangerous to Life or Health
IDW	Investigative Derived Waste
Ing	ingestion
Inh	inhalation
IP	ionization potential
LEL	lower explosive limit
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mg/m ³	milligrams per cubic meter
MSDS	material safety data sheet
NIOSH	National Institute for Occupational Safety and Health
NIST	National Institute for Standards and Technology
NWB	natural wet bulb temperature
OSHA	Occupational Safety and Health Administration
OVA	organic vapor analyzer
PEL	permissible exposure limit
PID	photoionization detector
PIR	positive instrument response
PPE	personal protective equipment
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
SSO	Site Health and Safety Officer
TLV	threshold limit value
WGBT	wet bulb globe temperature
°F	degrees Fahrenheit

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APPENDICES

APPENDIX A - Plan Acceptance Form

SECTION 1.0 INTRODUCTION

This HASP presents Versar's health and safety protocols governing the field activities that will be conducted during the Supply Side Landfill investigation at Naval Training Center Great Lakes (NTC). The HASP establishes guidelines for health and safety practices and personal protection for all Supply Side Landfill field work to be conducted by Versar and its subcontractors. The intent of the implementation of this plan is to ensure the health and safety of site personnel, the general public, and the environment. Although it is impossible to eliminate all risks, strict adherence to this plan by all personnel should aid in minimizing incidents and accidents by promoting safety, while maintaining productivity. This document is subject to modification, as warranted, if changes in activities and/or procedures are indicated. All field personnel, including subcontractors, are expected to read and be familiar with site-specific HASP for Supply Side Landfill.

SECTION 2.0 BACKGROUND

2.1 SITE LOCATION

NTC is required to continue to perform post closure maintenance on the Supply Side Landfill in accordance with the closure permit, state law and regulations and requirements of post closure plan. The Supply Side Landfill property covers an area of approximately 22 acres.

The Landfill is located on the southwest side of the NTC site. It is bordered by railroad tracks to the west, warehouse buildings to the north, Skokie Creek and residential/recreational areas to the east, and wastewater retention area to the south.

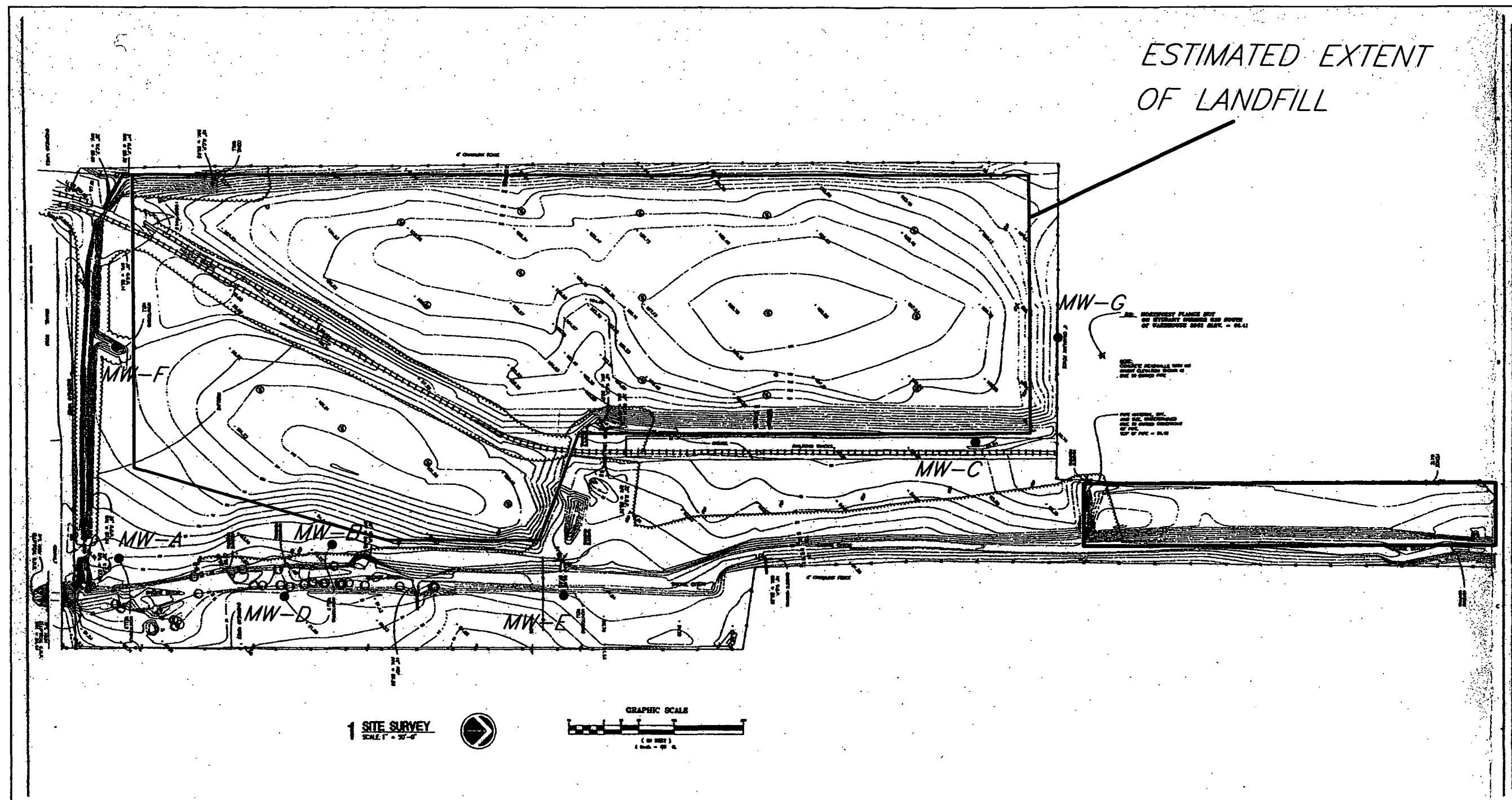
2.2 SITE DESCRIPTION

The landfill operated from 1969 to 1983 and reportedly received office waste and construction/demolition waste. The landfill consists of two cells, which are separated by an abandoned railroad bed which has since been covered. It is oriented in a north/south direction with overall dimensions of approximately 1,350 feet long by 650 feet wide. The maximum change in elevation from normal grade is approximately 15 feet with a maximum slope of approximately 20 percent. Significant features include passive gas vents and groundwater monitoring wells (see Figure 2-1).

2.3 PLANNED ACTIVITIES

The Supply Side Landfill cover study is being conducted to develop a closure plan and long-term care and monitoring plan for the facility, in accordance with applicable state and federal regulations. In general, field investigation work tasks include: aerial topographic control, borings to establish cap thickness, geotechnical analysis of existing cover, temporary monitoring wells to establish leachate head and sampling, and landfill gas evaluation.

While conducting the Supply Side Landfill field activities, personnel may contact contaminated media. The exposure routes possible during the site work consist of dermal contact, incidental ingestion, and inhalation of landfill gasses or fugitive dusts.



NOTE: RAILROAD TRACKS CURRENTLY COVERED

BASEMAP PROVIDED BY U.S. NAVY

TITLE:			FIGURE 2.1 SITE LAYOUT SUPPLY SIDE LANDFILL, GREAT LAKES ILLINOIS	
CAD: HDP	CHECKED: HDP	APPROVED: JA	FOR:	
DATE: 10/30/02	SCALE: RELATIVE		GREAT LAKES NAVAL TRAINING CENTER, GREAT LAKES, ILLINOIS	
Versar INC. 200 W. 22nd STREET, SUITE 250 LOMBARD, IL 60148			PROJECT NO. 110684.0001.001	
			DRAWING NO. LAYOUT	

SECTION 3.0 ORGANIZATION

3.1 SAFETY ORGANIZATION STRUCTURE

The Versar project team proposed to carry out the Supply Side Landfill Cover Study at NTC, as well as the Navy contact person, is as follows:

Name	Assigned Task
Gary Goodheart	Project Manager
Tim Jensen	Corporate Health and Safety Officer
John Angstmann	Field Investigation Task Leader/Project Health and Safety Manager
Terry Freudenrich	Field Manager/Site Health and Safety Officer (SSO)
Blayne Kirsch	Navy Technical Representative (NTR)

3.2 SAFETY PROGRAM MEMBERS AND RESPONSIBILITIES

The Health and Safety Manager, Site Health and Safety Officer (SSO), and field technicians will work as a team in order to accomplish the health and safety goals for this project.

Versar's Corporate Health and Safety Officer is responsible for ensuring that all corporate health and safety programs are adhered to by all Versar employees and subcontractors. The Corporate Health and Safety Officer has reviewed and approved this document.

The Project Health and Safety Manager will audit field operations to ensure that the health and safety protocols are followed at the NTC site. The Project Health and Safety Manager will report any problems in the field to the Project Manager, as well as the NTR.

The SSO has primary responsibility for ensuring that the day-to-day operations at the site are conducted in accordance with the HASP. The SSO will provide up-to-date information on safety requirements at daily meetings. The SSO will have the authority to stop operations if the actions or conditions at the site are judged to be unsafe or do not comply with the requirements of the HASP. Any deviations from the health and safety protocol will require documentation by the SSO and shall be reported to the Project Health and Safety Manager. The SSO will also act as the designated Incident Response Leader.

All site employees and subcontractors will be responsible for reading and complying with the HASP. In addition to following the HASP, no personnel will be permitted to perform any activity at the site that is believed to endanger their health and safety or the health and safety of others.

All site employees and subcontractors shall document their understanding by signing the Site health & Safety Plan (Appendix A). All persons entering the site shall be briefed by the SSO as to the hazards of the site. All persons entering the site shall sign a registration sheet, acknowledging that the SSO has briefed them of the hazards of the site.

SECTION 4.0 HAZARD ANALYSIS

This section describes the risks and hazards associated with the work to be conducted at Supply Side Landfill. Versar expects only chemical and physical hazards.

4.1 CHEMICAL HAZARDS

Chemical hazards include chemicals encountered in the soils, leachate, and landfill gas. All hazardous contaminants of concern and their hazards, are presented in Table 4.1. The contaminants listed in these tables were detected during the field investigation conducted by Toltest in August 2001 (*Delivery Order Completion Report Sampling and Analysis Testing of VOCs at Supply Side Landfill*), and include landfill gasses common to sanitary landfills; lead and manganese were included due to their presence in groundwater. Monitoring as described in Section 8.0 and Personal Protective Equipment as described in Section 6.0 will be required to minimize the hazards of exposure to site contaminants.

4.2 PHYSICAL HAZARDS

The physical hazards include heat stress, cold stress, noise, and hazards associated with field investigative techniques such as drilling, direct push technologies, and sampling. Detailed discussions of heat and cold stresses are presented in Sections 4.2.1 and 4.2.2, respectively. Workers are advised to drink plenty of fluids during the work day to avoid dehydration. The symptoms of dehydration are similar to those of heat stress which are presented in Section 4.2.1.

Risks of injury are possible whenever people work around stationary or moving equipment. Caution will always be practiced to avoid situations that may lead to unsafe conditions. Many accidents are caused by stumbling or tripping over objects associated with a cluttered work site. Personnel will exercise "good housekeeping" practices and maintain a clean and orderly work place in order to minimize the risk of injury from these types of hazards.

Other physical hazards that could be encountered at the site include inclement weather and vehicular traffic. Weather at NTC that could create a hazard includes high winds or tornados, large hail, and lightning. In the case of any of these conditions, personnel will immediately seek shelter in a permanent building. If shelter from high winds is not available, personnel should lie in any available ditch or other low area. Personnel should always be aware of vehicular traffic, and shall provide readily visible barriers, such as bright colored cones or tape if working near active roads.

Table 4.1
Health Hazard Values for Contaminants of Concern at Supply Side Landfill

Chemical Name	Highest Observed Concentration in Media	OSHA Permissible Exposure Limit ^{1/} (ppm)	Threshold Limit Value ^{2/} (ppm)	Immediately Dangerous to Life or Health ^{3/} (ppm)	Odor Threshold ^{4/} (ppm)	Ionization Potential ^{5/} (eV)	Symptoms/Effects of Acute Exposure and Exposure Pathways ^{5/}
Vinyl Chloride	0.7 ug/L LG	1 (29 CFR 1910.1017)	5	NA	3000	9.99	Weakness, abdominal pain, gastrointestinal bleeding, hepatomegaly, pallor or cyanosis of extremities. Targets liver, central nervous system, blood, respiratory system, lymphatic system. Carcinogen. Pathway: Inh.
Hydrogen Sulfide	NA	20	10	100	NA	10.46	Irritates eyes, respiratory system; apnea, coma, convulsions; conj. eye pain, lac, photo. corn versic; dizz, head, ftg, irrity, insom; GI dist. Targets eyes, respiratory system, central nervous system. Pathway: Inh, Con.
Naphthalene	10.2 ug/L LG	10	10	250	NA	NA	Irritates eyes, headache, confusion, excitement, malaise, nausea, vomiting, abdominal pain, irritates bladder, profuse sweating, jaundice, hematopoietic, hemoglobinuria, renal shutdown, and dermatitis. Targets eyes, blood, kidneys, liver, skin, red blood cells, central nervous system. Pathway: Inh, Abs, Ing, Con.
Ammonia	NA	35	25	300	5.2	10.18	Irritates eyes, nose and throat, dysp, bronspas, chest pain; pulm edema; pink frothy sputum; skin burns, vesic. Targets eyes, respiratory system, and skin. Pathway: Inh, Ing, Con.
Carbon Monoxide	NA	50	25	1200	Odorless	14.01	Head, tachypnea, nau, weak, dizz, conf, halu; cyan; depres S-T segment of electrocardiogram, angina, syncope. Targets CVS, lungs, blood, CNS. Pathway: Inh, Con.
Tetrachloroethene (PCE)	58.8 ug/L LG	100	50	500	47	9.32	Irritates eyes, nose and throat, nausea, flushed face and neck, vertigo, dizziness, incoordination, headache, somnolence, skin erythema, liver damage. Targets liver, kidneys, eyes, upper respiratory system, and central nervous system. Carcinogen. Pathway: Inh, Ing, Con.
Toluene	7.4 ug/L LG	200	50	500	0.16-37	8.82	Fatigue, weakness, confusion, euphoria, dizziness, headache, dilated pupils, lacrimation,

Table 4.1
Health Hazard Values for Contaminants of Concern at Supply Side Landfill

Chemical Name	Highest Observed Concentration in Media	OSHA Permissible Exposure Limit ^{1/} (ppm)	Threshold Limit Value ^{2/} (ppm)	Immediately Dangerous to Life or Health ^{3/} (ppm)	Odor Threshold ^{4/} (ppm)	Ionization Potential ^{5/} (eV)	Symptoms/Effects of Acute Exposure and Exposure Pathways ^{5/}
							nervousness, muscle fatigue, insomnia, dermatitis. Targets central nervous system, liver, kidneys and skin. Pathway: Inh, Abs, Ing, Con.
Trichloroethene (TCE)	18.8 ug/L LG	100	50	1000	82	9.45	Headache, vertigo, visual disturbance, tremors, somnolence, nausea, vomiting, eye irritant, dermatitis, cardiac arrhythmia, paresthesia. Targets heart, respiratory system, liver, kidneys, central nervous system, and skin. Carcinogen. Pathway: Inh, Ing, Con.
Methane	69 % LG	NA	NA	NA	200	NA	Symptoms of lack of oxygen include: increase depth/frequency of breathing, air hunger, dizziness, headache, nausea, or loss of consciousness.
Lead	NA	0.05 mg/m ³ (29 CFR 1910.1025) (as dust)	0.05 mg/m ³	100 mg/m ³	NA	NA	Weakness, lassitude, insomnia, facial pallor, pal eye, malnutrition, constipation, abdominal pain, colic, anemia, gingival lead line, tremor, wrist and ankle paralysis, encephalopathy, nephropathy, eye irritation, hypotension. Targets gastrointestinal tract, central nervous system, kidneys, blood, gingival tissue. Pathway: Inh, Ing, Con.
Manganese Soluble Compounds	_NA	5 mg/m ³ (ceiling) (as dust)	0.2 mg/m ³	500 mg/m ³	NA	NA	Parkinson's disease, asthenia, insomnia, mental confusion, metal fume fever, dry throat, cough, tight chest, dyspnea, rales, flu-like fever, lower back pain, vomiting, malaise, fatigue. Targets central nervous system, respiratory system, blood, kidneys. Pathway: Inh, Ing.

mg/kg - milligram per kilogram

mg/L - milligram per liter

NA - Not Available

ppm - parts per million

mg/m³ - milligram per cubic meter

eV - electron volts

Con - Skin or Eye Contact

Inh - Inhalation

GW - Groundwater

Abs - Absorption

LG - Landfill Gas

Ing - Ingestion

- ^{1/} Occupational Safety and Health Administration (OSHA) enforced average air concentration to which a worker may be exposed for an 8-hour workday without harm. Published in 29 CFR 1910.1000.
- ^{2/} Time weighted average as provided by the Guide to Occupational Exposure - 1993, American Conference of Industrial Hygienists, 1993.
- ^{3/} Immediately Dangerous to Life or Health (IDLH) maximum concentration from which in the event of respirator failure, one could escape within 30 minutes without a respirator and without experiencing and escape-impairing or irreversible health effects. For carcinogens, IDLH concentrations should not be considered safe for any length of time without supplied air respiratory protection. Published by the National Institute for Occupational Safety and Health (NIOSH), June 1990.
- ^{4/} 1993 Health and Safety Manual. Enserch Environmental 1993.
- ^{5/} NIOSH, June 1990.

4.2.1 Heat Stress

Heat stress is the result of the body's inability to maintain a normal body temperature because of excessive heat. Heat stress related problems include sunburn, heat rash, heat cramps, heat exhaustion, and heat stroke. The symptoms, causes, monitoring/prevention, and emergency response to these problems are summarized in Table 4.2.

Table 4.2
Heat Stress

Types	Symptoms	Causes	Monitoring/Prevention	Emergency Response
Sunburn	Red, painful, swelling skin. Severe cases: blisters, nausea, vomiting, and chills.	Overexposure to the sun.	Wear clothing or sunscreen on unprotected areas of the skin especially face and neck.	Not an emergency situation. Cold water on burned area. Elevate burned limbs.
Heat Rash	Rash	Exposure to heat and humidity. Aggravated by chafing clothes	Wear loose fitting clothes that adequately dissipate sweat.	Not an emergency situation. Change or rearrange clothing to more effectively dissipate sweat and heat, and prevent chafing.
Heat Cramps	Muscular pains originating in abdomen and legs (also associated with heat exhaustion). Heavy sweating and irrational behavior.	Loss of salt and inadequate intake of electrolytes.	Drink plenty of water or electrolyte replenishing fluids.	Not an emergency situation. Stop work and move to shade. Drink water or an electrolyte replenishing fluid such as Squincher every 15 minutes for an hour. Gently massage affected area.
Heat Exhaustion	Normal body temperature (98.6 °F oral), or slightly elevated or depressed, pale and clammy skin, profuse perspiration, weakness, headache and possibly cramps, nausea and dizziness, possible fainting.	Inadequate intake of water to compensate for loss of fluid through sweating	Watch for signs of heat stress. Initiate work/rest cycle (Table 5.4) at elevated ambient temperatures. Drink water, preferably, or electrolyte replenishing fluid every 15 minutes. Early detection will prevent heat stroke.	Move victim to shade, lie them down, elevate feet 8-12 inches, loosen tight fitting clothing, if conscious have them drink electrolyte replenishing fluid. Seek medical attention if symptoms persist.

Types	Symptoms	Causes	Monitoring/Prevention	Emergency Response
Heat Stroke	Elevated body temperature (>106°F oral), discontinuance of sweating, hot, red, and dry skin, rapid and strong pulse, unconsciousness, can be lethal.	Excessively high body temperature which disturbs or interferes with the body's own heat regulating system, lack of the ability to sweat.	Watch for signs of heat stroke. Initiate work/rest cycle (Table 5.4) at elevated ambient temperatures. Drink water or electrolyte replenishing fluids every 15 minutes. Protect the body from radiant heat.	Call for emergency help. Cool rapidly in air conditioned area or at minimum shaded area, remove clothing and bathe continuously with chilled water.

Permissible Heat Exposure Threshold Limit Values

The Threshold Limit Values (TLVs) listed in Table 4.3 will maintain a maximum body temperature below 100.4 degrees Fahrenheit (°F) for most acclimatized workers, assuming that they are wearing light clothing and have an adequate water intake. However, heat tolerance will be reduced when protective garments are worn, since cooling by the evaporation of perspiration will be decreased. Beneath protective clothing, a microclimatic condition prevails that cannot be determined from exterior environmental measurements. TLVs calculated from a formula that utilizes temperature, humidity, and work load will be used to directly evaluate the risk of heat stress.

Table 4.3
Permissible Heat Exposure Threshold Limit Values

Work/Rest Schedule	Work Load and Temperature (°F WBGT)		
	Light	Moderate	Heavy
Continuous	86.0	80.0	77.0
75% work, 25% rest/hour	87.0	82.0	78.5
50% work, 50% rest/hour	88.5	85.0	82.0
25% work, 75% rest/hour	90.0	88.0	86.0

Wet bulb globe temperature (WBGT) values are calculated by the following equations.

- Outdoors with solar load:

$$WBGT = 0.7 * NWB + 0.2 * GT + 0.1 * DB$$
- Indoors or outdoors with no solar load:

$$WBGT = 0.7 * NWB + 0.3 * GT$$

Where:

WBGT = Wet bulb globe temperature index

NWB = Natural wet bulb temperature

GT = Globe temperature

DB = Dry bulb

The determination of WBGT requires the use of a black globe thermometer, a natural wet-bulb, and a dry-bulb thermometer.

Monitoring Requirements and Prevention

A work-rest cycle shall be implemented at any time that heat stress poses a threat. The work-rest cycle procedure is given as follows:

- At the beginning of the work-rest cycle, the following parameters may be measured and compared to baseline measurements: body weight, oral temperature, and heart rate.
- At the end of the rest period, the heart rate should not exceed 100 beats per minute. If the heart rate is over 100 beats per minute, the person shall remain at rest until the heart rate is below 95 beats per minute.
- At the end of the rest period, oral body temperature will be measured. An elapsed time of 5 minutes shall be established between oral measurement of temperature and the consumption of cold liquids. The oral temperature must not exceed the baseline temperature. Workers will not be permitted to continue working when the oral temperature exceeds 100.4°F. If the oral temperature exceeds the baseline temperature but is less than 100.4°F, the worker is to remain at rest until the oral temperature is equal to baseline temperature.
- During the course of the work assignment, each worker must be monitored for signs of heat illness by the supervisor or a designated coworker.
- As a minimum for each 2-hour period worked, a 15-minute rest period is required.

Other general safety and health regulations to prevent heat stress include the following:

- Clean drinking water and containers shall be located at each work site in a designated clean area.
- Salt tablets shall not be used.
- Rest areas shall be located in a designated clean area away from the heat source(s), or shall be located in a shaded area with good ventilation.
- Small packets of ice shall be made available for cooling purposes.
- Field showers or a portable water supply may be used to help reduce body heat.

- Heavy work may be scheduled in the mornings or late afternoons, or when the sun is at its lowest intensity.
- Work will not be permitted during heat emergencies (i.e., heat waves) without the use of cooling jackets, vests, or suits.
- Supervisors not enforcing the work-rest requirements or not supplying workers with drinking water shall be relieved of their supervisory duties.
- Only electrolyte solutions (such as Squincher™ or other equivalent) approved by the SSO shall be used along with water.

4.2.2 Cold-Related Stress

Cold stress is caused by constant exposure of the body to temperatures at or below freezing. Factors contributing to cold stress include:

- Improper clothing
- Exposed skin
- Wet or moist clothing or skin
- Immersion in water
- Poor physical condition
- Alcohol and drug abuse
- Excessive heating of the body
- Fatigue

Other conditions contributing to cold stress include:

- Handling evaporative liquids such as acetone and alcohol
- Use of metal tools, and contact with cold surfaces
- Tightly fitting clothes or protective equipment
- Handling wet objects
- Wind

Table 4.4 describes the types, symptoms, causes, methods of monitoring and prevention, and emergency response for first, second, and third degree frostbite and hypothermia.

Table 4.4
Types of Cold Stress

Type	Symptoms	Causes	Monitoring/ Prevention	Emergency Response
Frostbite, First Degree	Skin blanches (becomes white), usually tips of ears, nose, cheeks, chin, and finger and toe tips. Prickling and itching of the skin, pain at first, and numbness.	Epidermal cells of body freeze from exposure to cold temperatures.	Wear warm clothes, protect extremities, take frequent warm-up breaks, monitor self and others for symptoms.	Place hands under the armpits or in other warm parts of the body. Heat of respiration may also be applied. Do not rub affected areas.
Frostbite, Second Degree	Skin and superficial tissue beneath it become white, waxy, and firm, although tissue beneath remains soft. General signs same as First Degree.	Epidermal cells of body freeze from exposure to cold temperatures.	See First Degree Frostbite above.	Place hands under the armpits or in other warm parts of the body. Heat of respiration may also be applied and/or external heat. Do not rub affected areas.

Type	Symptoms	Causes	Monitoring/ Prevention	Emergency Response
Frostbite, Third Degree	Freezing of skin, subcutaneous tissue, muscle and bone. Tissues are cold, pale and frozen to the touch. General signs same as First Degree.	Epidermal and internal cells of body freeze from exposure to cold temperatures.	See First Degree Frostbite above.	Immediate application of external heat, remove victim to warm shelter, remove gloves, boots, and socks to warm extremities. Warm carefully in controlled bath or warm water (104°F to 107°F) until color returns. If water is unavailable use warm packs or towels. Never rub or massage damaged areas. Do not allow victim to walk on frostbitten feet.
Hypothermia	Shivering, difficult speech, loss of dexterity, drowsiness, mental confusion and disorientation, decrease in pulse rate, blood pressure and body temperature, collapse, coma.	Lowering of body core temperature due to exposure to cold temperatures.	See First Degree Frostbite above.	Mild cases: Move to shelter and warmth as soon as possible, remove wet clothing, provide warm beverages. Severe cases: Seek immediate medical attention, remove victim's clothes and apply external heat in the form of warm water bath (105°F to 110°F). If water is not available, apply warm towels electric blankets, hot water bottles or heating pad. Check for frostbite.

Prevention of Cold-Related Stress

Cold-related stress can be prevented by keeping warm and dry, and by wearing appropriate layers of loose fitting clothes and a hat. In addition, overheating while working in the cold should be avoided. Evaporate perspiration by opening the neck, waist, sleeves, etc. Clothing must be kept dry.

Preventive Work Guidelines:

1. Exposure to cold will be immediately terminated by the supervisor or employee when severe shivering becomes evident.
2. Work will be arranged so that sitting or standing still for long periods of time is minimized.
3. The buddy system will be used and fellow employees monitored for signs of frostbite and hypothermia.
4. Adequate insulating clothing should be worn while working in air temperatures below 40°F. The wind chill factor is critical and can significantly lower the perceived temperature.
5. When air temperature falls below 30°F dry bulb (DB), temperature and wind speed will be measured periodically. The wind chill factor will be calculated to determine the risks of cold stress and steps initiated to prevent it.
6. Metal tool handles will be covered with thermal insulating material at temperatures below 30°F.

7. When work is performed continuously in the cold at a wind chill factor below 20°F, heated shelter will be made available.
8. A work/rest regimen will be considered when the actual temperature is below 0°F (advisory level).

4.2.3 Drilling and Direct Push Technologies Hazards

Numerous physical hazards are associated with drilling. Physical harm can be caused by improper or unsafe use of the drill rig or associated equipment, or faulty or poorly maintained drill rigs and equipment. Examples of unsafe use include improper stabilization and leveling of the rig prior to raising the mast, mishandling augers, and failing to wear a hardhat. Potential electrical hazards include electrical shock from lightning, drilling into live utility lines, contacting live utility lines with the mast of the drill rig, and using small electric hand tools improperly grounded. Potential fire or explosion hazards include drilling into live gas lines, electrical lines, buried containers, and drilling-induced releases of flammable or explosive contaminants from below the ground surface. Special care must be taken to prohibit pinching appendages between auger bits, rig components, etc. Potential chemical hazards include exposing personnel to hazardous substances during drilling, sampling, and decontamination. All borehole soils will be considered to be contaminated for handling purposes.

4.2.4 Sampling Hazards

The hazards associated with sampling are primarily chemical hazards. Hazardous substances may be encountered during sampling of soil, soil gas, or leachate. Other chemical hazards include the release of hazardous gases or vapors when gas vents are opened, splashing during leachate sampling, the release of hazardous vapors from preserved sample bottles, the release of hazardous gases or vapors during landfill gas sampling, and exposure to hazardous substances while decontaminating sampling equipment. All sampled media should be considered to be contaminated for handling purposes.

Physical hazards may be encountered when sampling in excavations, confined spaces, or hazardous atmospheres. Physical hazards may also exist if heavy equipment, such as a backhoe or hydraulic probe, is required for sample collection. All Occupational Safety and Health Administration (OSHA) regulations shall be adhered to, in addition to standard construction safety practices.

4.2.5 Noise

Hearing protection shall be worn in proximity to all noise sources with a sound level reading at or above 80 decibels. Hearing protection will be required when working around drill rigs and generators. It is not anticipated that hearing protection will be necessary during other site activities. Any activities, however, with noise levels approaching that of drill rigs will require use of hearing protection. Crews performing other site activities with noise levels potentially reaching these levels will be required to have noise meters, and will be required to don hearing protection when noise levels exceed 80 decibels.

4.2.6 Dehydration

Dehydration can occur any time the body loses more fluids than is taken in. Because many field tasks are potentially labor intensive and will require the use of PPE, there will be a risk of dehydration due to increase in perspiration rate. If dehydration is allowed to progress without treatment, it can contribute to heat stress and be potentially life-threatening. Symptoms of dehydration include thirst, dry mouth, weakness, or a tired feeling. Dehydration can generally be avoided by frequently drinking fluids during work activities. Breaks should be taken according to the work rest intervals provided in Section 4.2.1, and sufficient water consumed during these breaks. If dehydration symptoms are experienced, personnel should rest in a cool spot and drink plenty of water until the symptoms are eliminated.

SECTION 5.0 SITE CONTROL

The job site shall be controlled in order to minimize the risk of exposing personnel to the contaminants present at the site, and the risk of transport of contamination off site by personnel or equipment. Site control at Supply Side Landfill will consist of procedures for access control, contamination prevention, PPE, and communications. Discussions of the procedures are given in the following sections.

5.1 PROCEDURES FOR ACCESS CONTROL

Access to the site will be controlled by the SSO. Brightly colored caution tape will be used to define the extent of known potential contamination. In instances where caution tape will not adequately prevent public access, orange safety fencing will be erected.

5.2 CONTAMINATION PREVENTION

Contamination will be prevented through access restrictions and decontamination procedures. Decontamination shall occur before any personnel or equipment leaves the site. All IDW will be disposed of according to the Navy IDW Plan. Decon procedures are provided in Section 9.0.

5.3 AREAS REQUIRING PERSONAL PROTECTIVE EQUIPMENT

Most of the Supply Side Landfill work at NTC is expected to be conducted in Level D PPE with contingencies to increase to Levels C or B PPE. Areas requiring increased levels of PPE will be identified when ambient air monitoring indicates that the PELs could potentially be exceeded. PPE procedures are in Section 6.0.

5.4 COMMUNICATION

Both current and potential problems will be communicated to the SSO as soon as they are evident. The SSO will conduct daily meetings to communicate to the field team the hazards involved in the proposed day's work and any problems that may require additional precautions. Also to be addressed at the daily meetings will be the PPE requirements for the day.

The SSO will maintain constant contact with field personnel via use of two-way radios or cell phone. Hand signals may also be used such as the following:

- Hand clutching throat - out of air/cannot breathe
- Hands on top of head - need assistance
- Thumbs up - OK/I'm all right/I understand
- Thumbs down - no/negative
- One arm raised with open palm - stop work

- Two arms raised with open palms - evacuate area immediately
- Grip partner's wrist or both hands around partner's waist - evacuate area immediately

Any problems or emergency situations will immediately be communicated to the SSO. The SSO will determine the best course of action and initiate emergency procedures if necessary. An air horn (vehicle horn) will be used in the event of an emergency to communicate the need for evacuation.

5.5 SAFE WORK PRACTICES

Personnel involved in work at the site will be informed of standing work orders regarding safe work practices, will have adequate training, and will understand the HASP. Standing orders for those working at the site will include, but not be limited to the following:

- No smoking, eating, or drinking
- Use the buddy system
- Do not wear contact lenses
- Do not bring personal vehicles into potentially contaminated areas
- Do not use matches or lighters on site
- Check in and out at points of access control
- Wear appropriate PPE
- Avoid walking through standing water or stained soil
- Attend daily safety meetings
- Be cautious around heavy equipment and other tools
- Upon discovery of unusual or unexpected conditions, reevaluate site conditions and health and safety practices

Heavy equipment will be operated by qualified operators. Subcontractors will be required to follow safe work guidelines as described in OSHA General Industry (29 CFR 1910) and Construction Industry (29 CFR 1926) Standards. Heavy equipment will not be operated near power lines. The boom or riggings will always be maintained at a 20-foot minimum distance from power lines. Underground utilities will also be located prior to any drill work.

Electrical equipment will be correctly rated and grounded for its intended uses. Machinery will be guarded to prevent worker contact with rotating shafts, blades, or gears. Flammable materials kept on site will be clearly marked. While working around flammable materials all possible ignition sources will be eliminated. Non-sparking tools and intrinsically safe, class-approved equipment will be used when the situation warrants it.

5.6 ZONES OF CONTAMINATION

Most field work for the Supply Side Landfill will be conducted in Level D personal protective equipment (PPE) with contingencies to upgrade to Level C or B PPE. In the event that the upgrade is warranted, Exclusion, Contamination Reduction, and Support Zones will be set up in accordance with the requirements outlined below.

Ambient air quality in the breathing zone will be monitored. The work crew will be prepared for the contingency of upgrading to Level C or B PPE. It is anticipated that most work will be conducted in Level D PPE. Of course, members of the work crew may choose to don Level C PPE at any time during field activities, regardless of the readings on air quality monitoring instruments.

For intrusive work into the landfill refuse, and at any other location where contamination may be present in quantities high enough to pose a risk to the health and safety of the field personnel or the general public, an area composed of three concentric zones shall be set up. The three zones will be designated as (1) the Exclusion Zone, (2) the Contamination Reduction Zone, and (3) the Support Zone.

5.6.1 Exclusion Zone (Zone 1)

The Exclusion Zone, the innermost of the three concentric zones, is the zone where contamination occurs or potentially could occur. All personnel entering the Exclusion Zone must wear prescribed levels of PPE.

Factors that will be considered include the distances required to prevent fire or an explosion from affecting personnel outside the zone, the physical area necessary to conduct the site operations, and the potential for contaminants to be blown from the area. Once the "hotline" has been established, it will be well delineated by establishing landmarks or by using other appropriate means, such as using colored caution tape.

All personnel within the Exclusion Zone will be required to wear the required level of PPE. The appropriate PPE shall be determined by assessing on site-specific factors, including the type of work to be conducted and the hazards that might be encountered. Frequently within the Exclusion Zone, different levels of PPE may be required, but it is anticipated that Levels C and D will be sufficient. The level of protection shall be determined by the measured concentrations of substances in the air, potential for contamination, and presence of highly toxic substances.

Different levels of protection in the Exclusion Zone will also be required by job assignment. For example, collecting samples from leachate wells might require Level C or B protection, while walk-through ambient air monitoring may only require Level C or D protection. The assignment of variable levels of protection, as appropriate, within the Exclusion Zone will generally provide a more flexible, effective, and less costly operation, while still maintaining a high degree of safety.

5.6.2 Contamination Reduction Zone (Zone 2)

The Contamination Reduction Zone is located between the Exclusion Zone and the Support Zone. This zone serves as a transition zone between the contaminated and clean zones. Zone 2 serves as a buffer to further reduce the probability of the clean zone becoming contaminated or being affected by other existing hazards. The zone also provides additional assurance that the physical transfer of contaminated substances on personnel, equipment, or in the air is limited due to decontamination procedures, the physical distance between the Exclusion and Support Zones, air dilution, zone restrictions, and work functions.

Initially, the Contamination Reduction Zone shall be considered as a noncontaminated area. At the boundary between exclusion and Contamination Reduction Zones, decontamination stations shall be established, one for personnel and one for heavy equipment. These stations will be separated by a minimum distance of 3 feet or more. Exit from the Exclusion Zone shall be via a decontamination station. It is not expected that shelters will be necessary in the Contamination Reduction Zone.

The boundary between the Support Zone and the Contamination Reduction Zone is referred to as the Contamination Control Line, and separates the potentially contaminated area (Contamination Reduction Zone) from the clean Support Zone. Access to the Contamination Reduction Zone from the Support Zone shall be via a control point. Personnel entering at this location will be required to wear the prescribed PPE for working in the Contamination Reduction Zone. Entering the Support Zone will require removal of any PPE worn in the Contamination Reduction Zone.

5.6.3 Support Zone (Zone 3)

The Support Zone, the outermost zone of the zoned area, shall be maintained as and considered a noncontaminated or clean area. Support equipment, including the equipment trailer, will be located in this zone. Traffic into and out of this zone will be restricted to authorized personnel. Because normal work clothes shall generally be acceptable within this zone, potentially contaminated personnel, clothing, equipment, and samples will not be permitted to enter the zone, but shall be required to remain in the Contamination Reduction Zone until adequately decontaminated.

The location of the equipment trailer and other ancillary facilities in the Support Zone is dependent upon a number of factors, including:

- Accessibility - Accessibility considers topography, open space available, locations of highways, railroad tracks, or other physical limitations.
- Wind direction - The support facilities will be located, preferably, upwind of the Exclusion Zone. However, shifts in the wind direction and other conditions may prevent identifying an ideal location based on wind direction alone. Consequently, a greater distance from the Exclusion Zone may be required in order to situate the Support Zone.
- Resources - Resource considers adequate roads, power lines, water, shelter, and sanitation.

5.7 CONSIDERATIONS WHEN ESTABLISHING WORK ZONES

The distances between the hotline, Contamination Control Line, and equipment trailer, as well as the size and shape of each zone, shall be a function of those conditions specific to each site. Professional judgment is used to ensure that the distance between the zone boundaries is large enough to allow adequate room for the necessary operations, prevent the spread of contaminants, and reduce the possibility of injury because of explosion or fire.

The following criteria will be considered when determining zone dimensions and boundary distances between zones:

- Physical and topographical features of the site
- Climatological conditions
- Field air quality monitoring measurements
- Potential for fire, explosion, or flying debris
- Physical, chemical, toxicological, and other characteristics of the substances present
- Cleanup activities required
- Area required to conduct site operations
- Decontamination procedures
- Dimensions of contaminated area
- Potential for exposure to contaminants
- Surrounding features and uses, which may themselves be contaminant sources

The use of the three-zoned system, access control points, and exacting decontamination procedures will provide a reasonable line of defense against the translocation of contaminating substances. The zoned system discussed above assumes a "worst case" condition or scenario. In practice, less stringent site control and decontamination procedures are often used if more definitive information is found to be available regarding the types of substances involved and the hazards they present. This information can be obtained through air monitoring, instrument surveys and sampling, and technical data review regarding the characteristics and behavior of the materials present on the site.

5.8 DECONTAMINATION AREAS

The decontamination area shall be constructed of concrete or heavy gauge plastic sheeting, or suitable alternative method, shall be used at least on a daily basis and upon completion of the field work for final decontamination. In addition to a centralized decontamination area, additional decontamination

areas may be established to support each day's work. The decontamination area will be constructed in such a way that decontamination fluids and other wastes will be stored in containers, and will not contact the ground surface. All decontamination wastes will be properly disposed of in accordance with the Supply Side Landfill Investigative Derived Waste (IDW) Plan. The on-site work will be conducted within the Landfill Zone.

All equipment that requires decontamination will initially be decontaminated at the work site and then brought to the trailer decontamination area for final decontamination. If the equipment originated in an Exclusion Zone, it will first be decontaminated in the Contamination Reduction Zone prior to transport to the trailer area. Augers from the drill rig will be steam cleaned at a designated decontamination pad after drilling at each location.

All decontamination fluids will be collected in buckets, then poured into drums and stored on site for proper disposal according to the Navy IDW Plan.

SECTION 6.0 PERSONNEL PROTECTION

6.1 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS FOR EACH LEVEL

Most Supply Side Landfill work is expected to be conducted in Level D PPE with the contingency to upgrade to Level C or B.

Based on the day's projected work and anticipated potential for exposures, the SSO will designate the minimum level of protection for each activity that day prior to the start of any field activities. The SSO will inform the field crew of the hazards that may be expected in the field and the level of PPE that must be worn. The SSO and field crew will be required to use direct reading instruments (as applicable), such as a Combustible Gas Indicator, Organic Vapor Analyzer (OVA), the PID Total Organic Analyzer, Infrared Gas Analyzer, or colorimetric detection tubes, whenever hazardous atmospheric contaminants are known to exist, or are likely to be present. This information will help designate the level of PPE and respiratory protection required, and when an upgrade in the level of protection is warranted. Other information that will be investigated includes MSDSs, chemical composition and properties of the known contaminants, and other reference sources.

The following sections and Table 6.1 outline the five levels of protection, the equipment required at each level, and the rationale for choosing each level. In addition to the standard levels of protection, rubber over boots will be worn during all tasks conducted in the wetlands area to prevent trench foot.

6.1.1 Level A

Level A will be selected when the highest level of respiratory, skin, eye, and mucous membrane protection is needed. The Versar field crew will not conduct any work in Level A protection. If conditions require Level A, the NTC will be contacted and field work at the subject work site will cease until the conditions can be reevaluated.

6.1.2 Level B

Level B provides the highest level of respiratory protection, but a lesser level of skin and eye protection. A Level B upgrade will be required if the airborne contaminants detected using the organic vapor air monitoring equipment could not be identified using Dräger tubes as described in Section 8.2.1.

Table 6.1
Levels of Protection and Upgrade Criteria

Level of Protection	Respiratory Protection	Skin Protection	Upgrade Criteria
Level D	None	Hard hat Goggles or safety glasses Work gloves Socks Steel-toed shoes Coveralls, long sleeves	Air monitoring indicates no respiratory protection required.
Level C	Full-face, Air Purifying Respirator	Chemical resistant clothing Gloves, outer, chemical resistant Boots, chemical resistant, steel toe and shank Two-way radio	Air monitoring indicates known vapor or dust present .
Level B	Positive-pressure self-contained breathing apparatus	Same as Level C with: Gloves, inner, chemical resistant Boots, outer, chemical resistant Socks, cotton	Air monitoring indicates unknown vapor present, insufficient levels of oxygen.
Level A	Positive-pressure, self-contained breathing apparatus	Fully-encapsulating, chemical-resistant suit Gloves, inner chemical resistant Boots, chemical resistant, steel toe and shank Cotton socks Intrinsically safe tools, lantern, and two-way radio Personal radiation detectors	Air monitoring and conditions indicate unknown vapor present and threat to skin exposure, insufficient levels of oxygen. No work conducted at this level.

6.1.3 Level C

Level C protection will be selected when the type of airborne contaminant is known, its concentration has been measured, the criteria for using air purifying respirators have been met, and when skin and eye exposure is possible. Periodic air monitoring must be performed as described in Section 8.1. The level of protection will be upgraded to Level C if the air monitoring equipment indicates that vapors or dust are present of known types. The SSO will select the appropriate air purifying cartridges.

6.1.4 Level D

Level D protection is designed for use when only skin and eye protection is needed and airborne contamination is unlikely. Level D will be the initial level of protection chosen at NTC due to low levels of known contaminants present in the soils, water, and air. These levels do not present a threat to respiration or skin. If air monitoring equipment indicates an upgrade is warranted, the Level of PPE will be upgraded to C or B.

6.2 EQUIPMENT TESTING

The air monitoring equipment will be tested and calibrated prior to the start of each work day and recalibrated during the work day, if necessary. Additional testing will be completed if problems are detected with the equipment.

6.3 DECONTAMINATION PROCEDURES AND FREQUENCIES

A site worker will decontaminate his/her PPE when exiting the site, as described in Section 9.1. The decontamination of workers and equipment will take place in a predesignated area. If work was conducted in Level D, decontamination will occur when site workers leave the area where the work is being conducted and at the decontamination pad near the trailer. If work was conducted in Level C, decontamination will occur when site workers are in the Contamination Reduction Zone. All equipment will be decontaminated as described in Section 9.2.

SECTION 7.0 WORKER TRAINING AND MEDICAL SURVEILLANCE

7.1 OSHA STATUS OF EACH WORKER

All personnel who will conduct intrusive activities at the NTC site will be required to have successfully completed the Hazardous Waste Site Worker training required by 29 Code of Federal Regulations (CFR) 1910.120.

7.2 SITE WORKER TRAINING INFORMATION

All personnel conducting activities on site will comply with the health and safety protocols. Copies of the Supply Side Landfill HASP will be provided for all site personnel for review. Site workers who enter the site will also sign the Plan Acceptance Form (Appendix A) prior to entering. All site personnel will be required to read and follow the Supply Side Landfill HASP.

7.3 SCHEDULE FOR PRE-ENTRY BRIEFING

A field activities meeting will be conducted on a daily basis with all project personnel before starting field operations. Health and safety issues will be addressed each day as a component of this meeting. Procedural deficiencies will be identified, and corrective measures will be implemented. Because these briefings will be operation-specific, every element to be incorporated will not be addressed. However, the following elements have been listed to provide a guideline for discussion:

- Review of planned activities
- Substances suspected on site
- Levels of protection
- Locations of entry/exit points
- Location of safety equipment
- Operation-specific hazards
- Monitoring requirements
- Emergency and evacuation procedures
- Decontamination procedures
- Communications
- Field team responsibilities

7.4 DESCRIPTION OF MEDICAL SURVEILLANCE PROGRAM

Medical surveillance will be conducted in compliance with 29 CFR 1910.120 standards. Versar personnel who are required to perform on-site work must participate in Versar's Occupational Medical Program. The Occupational Medical Program consists of a baseline medical examination, special examinations, annual examinations, and a termination examination.

All personnel participating in field activities (including subcontractor employees) will be required to provide proof of participation in a medical monitoring program that is in compliance with 29 CFR 1910.120. The medical examinations must prove that subcontractor employees are certified as capable of working with hazardous substances and wearing a negative pressure respirator. This proof must be provided to the SSO and will be kept on file at the site until work activities are completed.

Special examinations will be scheduled if an employee believes (based on results obtained from monitoring, sampling results, lack of data, or ineffective protective devices and emergencies) that he or she may have been exposed to a hazardous substance. The employee will report this to his or her division health and safety officer. The division health and safety officer will contact the occupational medicine consultant and arrange for a special exam.

7.5 SITE-SPECIFIC REQUIREMENTS

No additional site-specific medical surveillance is expected for the NTC work. In the event of an exposure a special examination will be given to define the extent of exposure. In addition, an Exposure/Injury Report will be filed with the Versar Corporate Health and Safety Director. A copy of the report will also be filed with the Project Manager.

SECTION 8.0 MONITORING

8.1 AMBIENT AIR MONITORING

Ambient air monitoring will be conducted to assess the potential inhalation hazard to site personnel, as well as to detect unsafe atmospheres (such as explosive or oxygen deficient atmospheres) that may be associated with the work. Air monitoring will be required when site work involves potential exposure to airborne contaminants or hazardous or unsafe atmospheres. Such work activities include, but are not limited to, drilling, gas sampling and leachate sampling. Descriptions of the air quality parameters are presented in the following sections. Equipment calibration frequencies, air monitoring frequencies, and air monitoring locations are summarized in Table 8.1. Members of the public will not be allowed in the exclusion and Contamination Reduction Zones. Although exposures are not expected outside of these inner work zones, air quality will be monitored in the Support Zone, as well.

8.1.1 Organic Vapors

Air quality will be monitored at each work site that possesses the potential for an inhalation hazard. Each site will be monitored for organic vapors with either a photoionization detector (PID) or OVA, which is a flame ionization detector (FID). The PID is equipped with a 10.2 electron volt (eV) probe, which allows detection of volatile contaminants with ionization potentials less than 10.2 eV. This allows detection of all of the contaminants identified in previous studies at the site. The PID or FID will be calibrated prior to the start of work each day, and recalibrated during the work day, as necessary. Calibration results will be recorded, initialed, and dated in the calibration log book.

A background reading of air quality will be taken upwind of the work area prior to the start of work at each site. The reading will be measured as a positive instrument response (PIR), where a PIR of one is equivalent to one measurement unit on the PID or FID. Monitoring of air in the work area using the PID or FID shall be performed at a frequency of at least every 15 minutes and, during drilling, prior to the addition of each auger flight. Air monitoring will also be conducted immediately after opening a gas vent and prior to leachate sampling. The monitoring shall be conducted at a location approximately 4 to 6 feet above the ground surface (in the "breathing zone" of site personnel). All PID or FID readings, including background readings, shall be recorded in the field activity log book. This log book shall be kept as a separate document from the calibration log book document.

Table 8.1
Air Monitoring Information

Equipment	Calibration Frequency	Air Quality Parameter	Monitoring Frequency	Monitoring Locations
PID/FID	Once per day	Organic Vapors	At least once per 15 minutes	Breathing zone, soil boreholes, leachate wells
Multi-Gas	Once per day	Combustible/toxic gases	At least once per 15 minutes	Soil boreholes, leachate wells, gas vents
Dräger Tubes	None required	Vinyl chloride, ammonia	Following organic vapor detection w/ PID or FID	Breathing zone, soil boreholes, leachate

FID flame ionization detector

PID photoionization detector

Both instruments will be used in conjunction with one another. The OVA is capable of detecting most ionizable organic vapors including methane, and the PID can detect most ionizable vapors with the exception of methane (which has an ionization potential [IP] of 12.98 eV). Hence, when collecting data from a known source of methane gas, such as a landfill, the difference between the two readings may generally be attributed to the presence of methane.

At all locations where the PID indicates a reading greater than 1 part per million (ppm), a sample of air will be pulled through a Dräger tube (or field tested using a similar method) to ascertain whether vinyl chloride or ammonia is present.

A multi gas indicator (MGI) will be maintained on site during the field sampling work. The MGI will be used to measure the percent of the lower explosive limit in all locations that have measurable methane gas concentrations.

8.1.2 Particulates/Dust

Blowing dust has the potential to be a health hazard when work is performed in or downwind of areas with contaminated surface soils. There are no known areas of contaminated surface soils at this site. Prior to the start of work in any area, personnel should be aware of wind speed and direction, and the locations of contaminated surface soils (if present). Based on these parameters, personnel will determine whether dust particulates observed during the work day could potentially be carrying contaminants such that personal protection upgrades will be required. The SSO shall notify the work crew of changes in wind speed and direction if such change presents a concern of potential exposures for workers or members of the public. The SSO is responsible for determining whether an upgrade of PPE is required due to dust particulates, but workers may choose to don an air purifying respirator at any time.

8.1.3 Explosive/Toxic Gases

The presence of explosive atmospheres/gases during drilling activities and leachate well installation will be monitored using a MGI. Atmosphere monitoring using the MGI shall be performed at least every 15 minutes and, during drilling, prior to the addition of each auger flight. The monitoring shall be conducted as near as is safely possible to the top of the borehole as well as at a location approximately 4 to 6 feet above the ground surface.

8.1.4 Documentation

The SSO will document in his/her log book air monitoring readings encountered during the day. For elevated readings, the log shall include a description of the field work being conducted, names of all personnel at the site, types of air monitoring equipment used at the site, air monitoring results, and level of PPE worn.

8.2 ACTION LEVELS

8.2.1 Organic Vapors

If a sustained PID reading above the background level is detected in the breathing zone, personnel conducting the monitoring will immediately direct all personnel in the work area to shut off equipment and evacuate to a safe area upwind of the work area. If this cannot be done by word of mouth, one continuous blast of the air horn will function as the emergency signal. Personnel should then wait approximately 5 minutes, and then quickly re-check the breathing zone for the presence of organic vapors. The employee conducting the re-check shall be wearing a respirator equipped with an organic vapor cartridge while conducting the monitoring. If elevated readings are no longer present, the breathing zone should be continuously monitored for 5 minutes. If elevated vapor levels are not detected during this time period, work may continue, with air monitoring occurring at minimum 5- minute, rather than 15-minute, intervals.

On the other hand, if an elevated reading is again observed following the initial waiting period, another short waiting period shall be taken before again monitoring the breathing zone. If organic vapors are detected a third time, direct-reading colorimetric tubes such as Dräger tubes shall be used to identify the contaminant.

Dräger tubes should first be used to detect or discount compounds with the lowest TLV. Compounds to be screened for initially will include vinyl chloride. If none of these compounds is detected, then compounds with higher TLVs should be screened for next. Table 4.1 (ordered by lowest TLV) should be consulted for listings of chemicals detected and their TLVs.

If the contaminant and level can be identified by this method, personnel shall take appropriate action as directed by the HASP and the SSO. The SSO will be responsible for determining what level of PPE will sufficiently protect workers from overexposure, based on available data. Factors to be considered by the SSO when determining the appropriate levels of protection will include the OSHA permissible exposure limits (PELs), odor thresholds of contaminants, and capabilities and limitations of the PPE. A summary of the OSHA permissible exposure data is provided in Table 4.1.

If the contaminant causing the positive reading cannot be identified using direct-reading tubes, personnel will be required to use Level B PPE in the work zone.

8.2.2 Particulates/Dust

If visible blowing dust is observed in areas that have been determined to be in or potentially downwind of contaminant-carrying particulates, personnel shall be required to upgrade to Level C protection. Versar shall make this decision at the work site, in conjunction with the SSO. This protection shall include air purifying respirators equipped with organic vapor/high efficiency particulate air (HEPA) or P100 cartridges. The organic vapor portion of the cartridge has been included as an extra safety feature because combination cartridges are available.

8.2.3 Explosive Atmospheres

If the MGI reading at any time exceeds 10 percent of the lower explosive limit (LEL), personnel will immediately shut down all equipment and eliminate any other potential ignition sources in the area. All personnel will then be directed to evacuate the work area. If this cannot be done by word of mouth, one continuous blast from the air horn shall function as the emergency signal. The evacuation area will be a safe distance upwind of the source of the explosive vapors, as determined by the SSO based on readings from the MGI. After a 5-minute waiting period has elapsed, the atmosphere shall again be monitored. Work shall not resume until less than 10 percent of the LEL is present in and adjacent to the borehole or work area for at least 5 minutes.

If LEL readings do not subside, then alternative measures such as allowing for borehole to vent, or bentonite slurring the auger head to prevent gas escape, shall be considered.

Monitoring shall be conducted continuously for a minimum of 15 minutes after work has been restarted. Although there is no danger of explosion above the upper explosive limit, no work will be conducted at organic contaminant concentrations above 10 percent of the LEL.

8.2.4 Oxygen-Deficient Atmospheres

Atmospheres containing less than 19.5 percent oxygen by volume are considered oxygen-deficient. If an oxygen-deficient atmosphere is detected, work must cease immediately and the work area evacuated of all personnel. If this cannot be conveyed by word of mouth, one continuous blast of the air horn shall function as the emergency signal. Work may not continue until oxygen levels return to levels that are greater than 19.5 percent by volume, or until personnel are equipped with supplied air.

8.3 DESCRIPTIONS OF INSTRUMENTS

Instruction and maintenance manuals for all of the air monitoring instruments described below will be available on site. All personnel that may be required to use monitoring instruments shall be thoroughly familiar with air monitoring equipment operating and calibration procedures. Personnel shall not attempt to perform any cleaning or maintenance that is recommended to be performed by the manufacturer, in accordance with the manufacturer's recommendations.

8.3.1 Photoionization Detector

The PID 2020, which will be used for this project, is typical of field ultraviolet photoionization units now available. It consists of two parts: the readout assembly or main body of the instrument, which includes the meter indicator, controls, and power supply; and the probe, which contains the sensing and amplifying circuitry.

As samples of gas or air are drawn into the probe, they are ionized by an ultraviolet lamp. An instrument response is observed if the IP of the gas is equal to or less than the ionizing energy supplied by the ultraviolet lamp in the probe. As a molecule of contaminant is ionized, the ultraviolet radiation produces an ion pair. The free electrons thus produce a current that is proportional to the number of ions produced. The instrument readout is therefore a measurement of the current caused by contaminant ionization.

The PID is available with 9.5, 10.2, or 11.7 eV light sources. Contaminants with ionization potentials greater than that of the lamp will produce little or no instrument response, and may escape detection. Of all contaminants previously detected at the work site, the highest ionization potential is that of vinyl chloride (9.99 eV). Because of this, a PID with a 10.2 eV lamp will be required for air monitoring conducted for health and safety purposes.

8.3.2 Organic Vapor Analyzer

Like the PID, ionization is used for an OVA (FID) as the detection method. The ionization in an FID, however, is a hydrogen flame rather than ultraviolet light. The flame has sufficient energy to ionize any organic compound with an IP of 15.4 or less, which includes all contaminants previously encountered at Supply Side Landfill.

In the detection chamber, the sample is exposed to a hydrogen flame that ionizes the organic vapors. When the organic vapors burn, carbon-containing ions are generated and are collected by a charged collecting electrode in the chamber. As the ions are collected, a current is generated on the input electrode. The current is proportional to the concentration of organic vapors, and is translated into a meter reading.

8.3.3 Explosimeter/Toxic Gas Meter

Multi-gas indicator is a multiple function air monitoring device, capable of testing atmospheres for sufficient oxygen content for life support and the presence of combustible or toxic gases such as hydrogen sulfide.

The flammable properties of combustible gases are used as a basis of detection in the MGI portion of the instrument. The sensor consists of a pair of pelletized filaments arranged in an electrically balanced bridge circuit. The filaments are treated with a special catalyst which causes the combustible gases to combine with oxygen at a much lower temperature than required for normal burning. Combustible gases in the sample combine with oxygen at the surface of the detector filament. Heat is liberated by this chemical reaction, increasing the temperature and electrical resistance of the filament. The resistance is then translated through an amplifier to the digital meter.

The oxygen indicator is a galvanic-type cell containing dissimilar metal electrodes in a special electrolyte. The cell is sealed with a membrane which allows oxygen to diffuse into the active area. The current generated by the cell is proportional to the oxygen partial pressure in the atmospheric sample passing over the membrane face. The generated current passes through a resistance to provide a voltage input signal for an amplifier. The output of the amplifier drives the digital display.

SECTION 9.0 DECONTAMINATION PROCEDURES

During the course of the work in contaminated areas at the site, decontamination of personnel and equipment will be required. Complete procedures for decontamination, and for proper handling and disposing of IDW are provided in the Navy IDW protocol.

9.1 PERSONNEL DECONTAMINATION

Whenever field personnel are working in the field at Level C or higher of protection levels, concentric zones to limit the spread of contamination will be set up as described in Section 5. All field personnel will be informed of the correct decontamination procedures for the work that is being conducted.

At no time, with the exception of a medical emergency, will contaminated or potentially contaminated personnel, clothing, or equipment be placed in personal, company, or rental vehicles.

For Level D work, personnel decontamination will include the proper disposal of disposable PPE, the washing of reusable gloves, boots, and Saranex, and the washing of face, hands, and other exposed body parts prior to exiting the site. Field personnel may elect to store some disposable PPE, such as Tyvek coveralls, in the on-site trailer for the next day's work.

For Level C work, personnel decontamination will include the proper disposal of disposable PPE, the washing of reusable gloves, boots, Saranex, and air purifying respirator while in the Contamination Reduction Zone, and the washing of face, hands, and other exposed body parts prior to exiting the site.

9.2 EQUIPMENT DECONTAMINATION

A decontamination site will be designated at the start of each day's activities. For any work conducted in Level C PPE, heavy equipment and sampling equipment used during the activity must be decontaminated in a designated Contamination Reduction Zone.

Drill rigs, trucks, and other heavy equipment will be washed with water under high pressure and/or scrubbed with a detergent/water solution under pressure and rinsed with potable water, as necessary. Caution will be taken when decontaminating heavy equipment with pressure washers and steam cleaners since these washing techniques can volatilize contaminants. In addition, moisture, especially steam, can increase the breakdown of air purifying respirators.

Sampling equipment will be thoroughly washed with detergent (e.g., Alconox) and water solution, followed by a potable water rinse. If the sampling equipment is too delicate to be physically washed, it will be bagged, and the bag taped and secured around the instrument. Decontamination will consist of removing and disposing of the bag.

SECTION 10.0 EMERGENCY RESPONSE PLAN

10.1 EMERGENCY RECOGNITION

All personnel must read and be familiar with this Emergency Response Plan. Emergency telephone numbers are presented in Section 10.4 of this plan. The route to Great Lakes Naval Hospital (Figure 10-1) should be followed for emergencies occurring at Supply Side Landfill.

Prior to initiation of work, the SSO will conduct a meeting to review all aspects of the HASP as well as review the emergency response procedures. Attendance at this meeting will be required for all field personnel. Field personnel will be required to have an accessible copy of the emergency contacts and phone numbers, and to know the route to the nearest emergency medical facilities. Attendance record shall be kept with the field documentation.

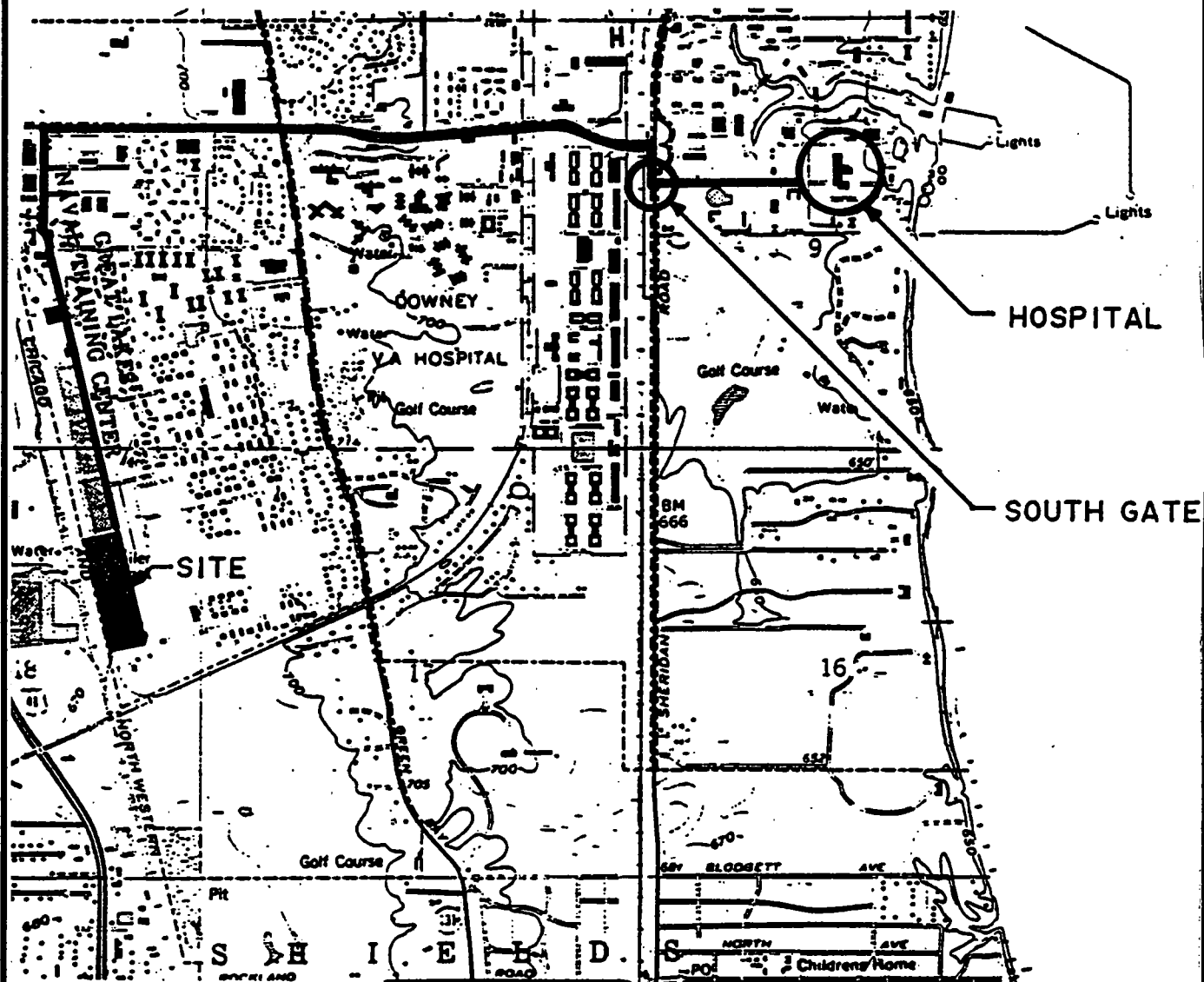
Any one of the following conditions or situations shall be considered to be an emergency condition:

- A crew member suffers injury, accidental or otherwise, or displays symptoms of overexposure to heat or cold.
- A crew member has been exposed to a hazardous substance.
- Ambient concentrations of organic vapors above background levels are indicated by monitoring instruments with readings taken from the breathing zone of site workers.
- Explosion risk is indicated by monitoring instruments (combustible vapor concentrations exceed 10 percent of the LEL).
- Discovery of unanticipated hazardous conditions.

10.2 EMERGENCY RESPONSE PROCEDURES

In the event of an emergency, all available information must be properly evaluated, and the appropriate steps taken to implement the Emergency Response Plan. The SSO shall always be immediately informed of any emergency, and shall take command of the situation. He/she must call the appropriate emergency services, evacuate personnel to the pre-designated evacuation locations, as needed, and take other steps necessary to gain control over the emergency. When reporting the emergency to the SSO, personnel should thoroughly describe the situation, including the following information:

- Time and location of the emergency
- Type of emergency (accident, medical, explosion, fire, chemical release)
- Number of injured and type(s) of injuries
- Wind direction and speed



DIRECTIONS TO HOSPITAL:

FROM SITE GO NORTH ON SUPERIOR ST. (TURNS INTO MISSISSIPPI ST.). TURN RIGHT (EAST) ON BUCKLEY RD. TURN RIGHT (SOUTH) ON SHERIDAN RD. TURN LEFT (EAST) AT NTC SOUTH GATE. HOSPITAL IS 4 BLOCKS AHEAD.

GREAT LAKES NAVAL HOSPITAL

AMBULANCE (708) 688-5555
EMERGENCY (708) 688-5618

REFERENCE MAP:
WAUKEGAN, ILLINOIS QUADRANGLE
ILLINOIS-COOK COUNTY
7.5 MINUTE SERIES (TOPOGRAPHIC)
PHOTOREVISED 1980



TITLE: FIGURE 10.1 HOSPITAL ROUTE MAP SUPPLY SIDE LANDFILL, GREAT LAKES, ILLINOIS		
CAD: HDP	DATE: 11/8/02	FOR: GREAT LAKES NAVAL TRAINING CENTER, GREAT LAKES, ILLINOIS
APPROVED: HDP	SCALE: 1"=2000'	
Versar INC. 200 W. 22nd STREET, SUITE 250 LOMBARD, IL 60148		PROJECT NO. 110684.0001.001
		DRAWING NO. HOSPITAL

Evacuation locations shall be designated by the SSO for each work area prior to the start of work each day. The evacuation area shall be of sufficient distance from the work area to provide protection from fire, explosion, or chemical exposure, as necessary. During an evacuation, air quality monitoring instruments will continue to be used to ensure that the distance is sufficient. Additionally, a back-up evacuation area shall be designated if the primary area is unsuitable (e.g., downwind of a chemical release). A wind direction indicator will be mounted next to the work site to notify the on-site personnel of changes in wind direction. Communication will be established between those crews in the work area and the Support Zone allowing crews to contact one another or emergency services with regard to contamination releases or dispersal, changes in wind direction, etc.

10.2.1 Medical Emergencies and Accidents

Safety Practices

- Personnel shall always be alert for signs and symptoms of illnesses related to chemical, physical, and disease factors on site.
- Personnel shall be aware of the signs and symptoms of heat stress, cold stress, and fatigue.
- Personnel shall work in pairs, when possible, and maintain visual contact between pairs to detect signs and symptoms of medical emergencies.
- At least two personnel currently trained in first aid/cardiopulmonary resuscitation (CPR) must be present on site at all times.
- A mobile telephone or radio and first aid kit shall be provided at each work site.
- Personnel shall use "good housekeeping" practices at the job site.
- Personnel shall be aware of heavy equipment and other vehicular traffic at the site.
- Personnel shall be on the lookout for and rectify unsafe conditions that could result in injury (unprotected trenches or holes, exposed electrical wires, etc.)
- Personnel shall practice work procedures prior to conducting them in the field.

Emergency Procedures

In the case of a medical emergency or personal injury, life saving procedures should be administered by trained personnel who are closest to the victim. This assistance shall be conducted so that those rendering assistance are not placed in a situation of unacceptable risk. The SSO must notify all personnel of the emergency situation, upon which all work must stop and personnel, aside from those assisting the victim, must move from the Exclusion Zone to the decontamination area. If the emergency situation cannot be conveyed by word of mouth or hand signals, an air horn will be sounded. One continuous blast of the air horn will be used as the emergency signal.

Following the use of life saving procedures, personnel currently trained in first aid will evaluate the nature of the injury, decontaminate the victim if the victim can be moved safely, and initiate first aid.

Decontamination of the victim will be done in accordance with Emergency Decontamination Procedures. The SSO will decide whether local emergency medical services are necessary and, if needed, notify them immediately. Victims that are heavily contaminated with toxic or dangerous materials must be decontaminated before being transported from the site. No persons shall re-enter the Exclusion Zone until the cause of the injury or symptoms has been determined and controlled. The SSO is responsible for controlling entry, and Level B equipment must be used for any personnel retrieval from the Exclusion Zone if a chemical exposure caused the incident. If not, the exact nature of the injury must be determined and communicated to rescue personnel. Personnel will transport victims to emergency medical facilities only if (1) the site is so remote that timely response of medical professionals is not possible, or (2) the injury does not pose an immediate threat to life, and transport to the emergency medical facility can be accomplished without the risk of further injury. Routes to the nearest medical facility are shown on Figure 10-1.

10.2.2 Chemical Exposure Emergencies

Safety Practices

- Properly use the appropriate PPE.
- Provide eyewashes in work trailers and portable eyewashes and showers in decontamination zones for remote sites with exposure potential.
- Provide a mobile telephone or two-way radio at each work site.
- Provide a first-aid kit and potable water supply at each work site.
- Use care when handling and working around chemicals.
- Properly calibrate and operate monitoring equipment to detect chemicals.

Emergency Procedures

In the event of a chemical exposure or potential exposure emergency, victims must first be removed from the immediate area of contamination to an upwind location. If the emergency conditions are caused by chemical exposures, rescuers shall don air purifying respirators, or supplied air if it is believed to be necessary, before approaching the victim.

Once the victim is removed from the source area, precautions shall be taken to avoid exposure to other individuals, particularly those assisting the victims. If an apparent chemical exposure has occurred, field personnel shall first grossly decontaminate the victim using towels, cloth, an emergency shower or other available means. Personnel closest to the victim should then administer life saving procedures, if necessary. This assistance shall be conducted in a manner such that those rendering assistance are not placed in a situation of unacceptable risk. Once decontaminated, all personnel should proceed to the pre-designated evacuation area located upwind of the emergency area. Emergency medical services should be called immediately, if deemed necessary. The person calling the emergency medical services must inform the operator of the nature of the emergency, including the type of chemical exposure, if known.

If the chemical is on the victim's clothing, the clothing shall be removed by other personnel wearing appropriate personal protective equipment. If the skin has been exposed, it should be thoroughly washed with soap and water, preferably in an emergency shower. The affected area should be washed and rinsed for a minimum of 15 minutes. If the eyes have been exposed, an emergency eye wash should be used to flush the eyes for at least 15 minutes. In the case of an inhalation exposure, the victim should be decontaminated, and emergency medical services contacted immediately. For a chemical exposure by ingestion, determine what was ingested and contact emergency medical services.

Personnel shall transport victims to emergency medical facilities only if (1) the site is so remote that timely response of medical professionals is not possible, or (2) the injury does not pose an immediate threat to life, and transport to the emergency medical facility can be accomplished without the risk of further injury.

10.2.3 Fire/Explosion Emergencies

Safety Practices

- Smoking shall not be permitted in any work area. Smoking shall be allowed only in designated areas at the site.
- Look for and eliminate exposed wires or other ignition sources.
- Store flammable liquids only in approved containers and fire-proof cabinets.
- Provide fire extinguisher in all indoor work areas as well as on drill rigs and other heavy equipment.
- Do not proceed with drilling, digging, or other underground work unless all utilities have been located.
- Provide a mobile telephone or two-way radio at all work areas.

Emergency Procedures

Any fire or explosion must be immediately recognized as an emergency. All victims should be moved away from the danger if this can be done without exposing rescue personnel to unacceptable risk. Personnel closest to the victim should administer lifesaving procedures, if necessary. The SSO should be notified immediately. The SSO must sound the emergency signal, and personnel must decontaminate and be evacuated to the pre-designated evacuation location. If the emergency situation cannot be conveyed by word of mouth or hand signals, one continuous blast of the air horn will function as the emergency signal. Other than small fires which can be extinguished with an immediately accessible fire extinguisher, emergency services must be immediately notified in order to handle the emergency. The SSO should take measures to reduce injury and illness, primarily by evacuating personnel as quickly as possible. He/she must then notify the Project Manager. Clean-up after such events may require specialized clean-up services. The Project Manager will be responsible for determining which proper clean-up actions are necessary. Site personnel shall not resume work during or after a fire/explosion incident until the incident is over and the SSO has directed that the incident is over and work may resume. During the incident, site personnel shall remain outside the incident area as directed by the SSO.

10.3 EMERGENCY DECONTAMINATION PROCEDURES

In the event of an emergency situation occurring within the Exclusion Zone, personnel may be required to make quick decisions concerning the urgency and nature of the emergency. For some victims, immediate decontamination may be an essential part of first aid. For others, decontamination could aggravate the injury or delay necessary lifesaving treatment. In general, decontamination should follow the procedure outlined in Section 9.0 of this HASP. In life-threatening situations, however, strictly adhering to these procedures may not be an option.

In the case of an emergency situation, on-the-scene personnel with first-aid/CPR certification must first determine (1) whether lifesaving procedures are required, and (2) if the contaminants involved are extremely hazardous. If lifesaving procedures are required and extremely hazardous contaminants are visibly or potentially present on the victim, the person administering first aid should attempt to grossly decontaminate the victim and/or wrap contaminated areas with any available material to avoid contaminating himself/herself.

If a victim requires transport to the nearest emergency medical facility, protection of the transport personnel must be considered. Measures should be taken to minimize chemical contamination of the transport vehicle, hospital, and rescue/hospital workers. Adequately protected rescuers should decontaminate the victim as much as time and other factors permit. If sufficient decontamination is not an option, the victim should be covered with sheeting. Prior to transport, determine what level of protection is necessary for transport personnel and provide such protection such as coveralls, gloves, respirators, etc.

10.4 EMERGENCY CONTACTS

Communications will be by two-way radio, cellular phone, or by telephones located across the Base. In the case of an emergency situation, the closest and fastest method of communication should be used. Telephone or radio contact should first be made with the SSO or site emergency personnel, who will then contact the appropriate emergency response agencies. In the case of a serious medical emergency, emergency medical services should be contacted first. Contacts and telephone numbers are as follows:

Name	Position	Phone Number
Gary Goodheart	Project Manager	(630) 268-8555 x220 cell (630) 605-8504
Tim Jensen	Corporate Health and Safety Officer	Cell (703) 623-1405
John Angstmann	Field Task Manager/Health and Safety Manager	(630) 268-8555 x207 cell (630) 605-8508
Terry Freudenrich	Site Health and Safety Officer	(920) 860-0321
Blayne Kirsch	Navy Technical Representative (NTR)	(847) 688-5999 x145
Fire Department	---	911
Police Department	---	911

Name	Position	Phone Number
Emergency Medical Services	---	911
Illinois Emergency Management Agency	---	1-800-782-7860
Poison Control Center	---	1-800-332-3073
CHEMTREC (Chemical Release Emergencies)	---	1-800-242-9300

Directions to Great Lakes Naval Hospital: From Site, go North on Superior St. (turns into Mississippi St.). Turn Right (East) on Buckley Road. Turn Right (South) on Sheridan Road. Turn Left (East) at NTC South gate. Hospital is 4 blocks ahead.

10.5 EMERGENCY FOLLOW-UP

The SSO must complete an Accident Report Form and submit it to the Project Manager and the Corporate Health and Safety Officer within 24 hours of the following types of incidents:

- All job related injuries and illnesses.
- All accidents resulting in more than \$25 loss or damage.
- All accidents in which there may have been no injury or property damage, but which have a high probability of recurring with a risk of injury or property damage.
- Any accident that results in a fatality or the hospitalization of five or more employees must be reported within 24 hours to the U.S. Department of Labor through the Project Manager.

All accidents must also be reported to the NTR.

Following an emergency, the SSO should review the emergency procedures and, if necessary, revise the procedures. When reviewing the emergency response, items to be considered should include the cause of the emergency, possible methods to prevent a similar emergency, and possible ways to improve the emergency procedure. The emergency procedures should then be revised, if necessary, based on any new site conditions or lessons learned from the emergency response.

The SSO and/or Project Manager should initiate the investigation and documentation of any emergency situation. This is especially important when the incident resulted in injury or property damage. Documentation could potentially be used to help avoid recurrence, as legal support, for assessment of liability, and for government review. Documentation of accidents or other emergencies shall be completed as soon as possible following the incident.

At a minimum, documentation should include:

- Chronological history of the emergency
- Facts about the incident and when they became available
- Names and titles of all personnel involved
- Actions taken, orders given, and decisions made (who, what, where, and when)
- Any monitoring results or sample results that may be applicable (LEL, PID, or FID readings, for example)
- Site personnel exposed to the hazard
- Summary of all injuries or illnesses that have occurred during, or resulting from, the incident
- Completion of an Exposure Report form in the case of chemical exposure

All documentation must be signed and dated by those making entries. All entries shall be made in ink. Any changes to the documentation must be initialed and dated.

10.6 BLOODBORNE PATHOGENS

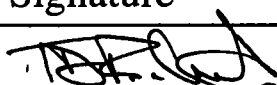
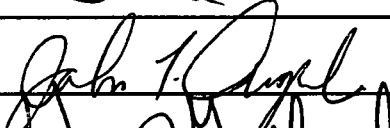
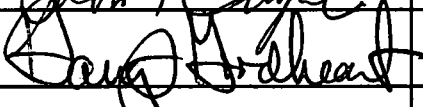

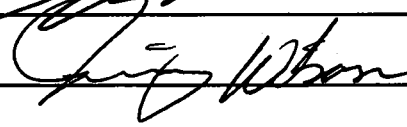
Exposure to bloodborne pathogens (BBP) is possible in the case of certain emergency situations. Personnel may be exposed to body fluids such as blood, saliva, vomitus, or mucus, among others. These fluids could contain pathogens which have the potential for causing disease in humans. Should personnel be required to administer life saving procedures, such as CPR, the following procedures shall be followed to minimize the potential for exposure to BBPs:

- Wear disposable gloves when hand contact with blood, mucous membranes, non-intact skin, or other potentially infectious materials could be involved.
- Use disposable mouthpieces, pocket masks, or other ventilation devices for administering artificial ventilation.
- Wash hands with soap and water after administering first aid.
- In the case of eye contact with body fluids, flush eyes using an eye wash for at least 15 minutes.
- Remove garments contacted by blood or other body fluids as soon as possible.
- Do not eat, drink, smoke, or handle contact lenses in work areas with possible BBP exposure.

- Persons cleaning up an accident scene should not pick up broken glass or other sharp objects by hand. All clothes and other items at the first aid scene should be safely secured prior to leaving.
- Employees who may have been exposed to BBPs should immediately report the incident to the SSO.

APPENDIX A
PLAN ACCEPTANCE FORM

The undersigned have read, reviewed and understand the Health and Safety Plan (HASP) prepared for NTC Supply Side Landfill, Great Lakes, Illinois. Furthermore, the undersigned have received training on the specific provisions of the HASP and any specific requirements of the plan based on site conditions. The undersigned agrees to abide by all provisions incorporated into the plan.

Name	Signature	Date
Terry Freudenrich		Nov 20, 2002
John Angstmann		11/20/02
Gary Goodheart		11/20/02
Jeremy Hays		11/20/02
Jimmy Wilson		11/20/02